

CLAIMS

I CLAIM:

1. A device for automatically resetting the emergency brake on trains of the type comprising a main conduit (100) from which a conduit (100a) branches off characterised by the fact that the said device comprises:
 - a handle (11) composed of a handgrip (11a), designed to activate the emergency brake, and a shank (11b);
 - a rotary plate (18) with a substantially triangular configuration and designed to rotate clockwise upon the command of the handle and anticlockwise upon the action of a couple of levers (30 and 31);
 - a main piston (10) which comprises a central shank (10a) with, at a first end, a T-shaped element (10b) designed to slide inside a chamber (7) from a resting position, in which the wings of the T are in contact with an internal wall (7b) of the chamber (7) and compress a spring (71) and a spring (17c), into a working position in which the wings of the T are in contact with an opposite wall (7c) of the chamber upon the action of also the springs (71 and 17c) which facilitate its movement and, at the other end of the shank, a substantially cylindrical element (10c) which is designed to move inside a chamber (17);
 - a first tank (2) envisaged for the accumulation of the air to be used for resetting the device, after its activation, and connected to the main conduit (100) by means of a plurality of channels (3a, 3b, 3c, 3d and 3e);
 - a first channel (2a), a second channel (2b) and a third channel (2c) which start at the tank (2) and arrive respectively at a chamber (5), the main piston (10) and at a small chamber (6a), in which there is a small piston (6);
 - the chamber (7) into which the air coming from the tank (2) expands and causes the movement of the main piston (10);
 - a channel (25) which connects together a small chamber (14a) and the chamber (7) for the flow of air to the said chamber and a channel (26) which starts from the chamber (7) and is designed to release the air from the said chamber into the external atmosphere;
 - a plurality of channels (22, 24 and 27);

- monitoring means (60) envisaged to signal, at the moment the train is composed, if the handle (11) has been pulled unduly and the device is in the operative condition;
 - a stabilising element (70) engaged with the shank (11b) and rotatably engaged with the structure of the device;
 - resetting means (16) connected to the stabilising element (70).
2. A device according to claim 1 characterised by the fact that the said shank (11b) has a substantially cylindrical configuration and has a couple of gaps (11c and 11d) which are symmetrical in relation to the axis of the said shank, a first overhang (11e) on the side with the gap (11d), a groove (11f) and a second overhang (11g) located in sequence on the side with the gap (11c).
 3. A device according to claim 1, characterised by the fact that on the shank (11b) there is a rod (13), a first section of which is connected with one end (13a) to the said shank and with the other end (13b) to a small piston (14) and, a second section of which is connected to the small piston (14) and to the small piston (6).
 4. A device according to claim 1, characterised by the fact that the said shank (11b) is fitted with a joint (15) designed to bring the handgrip (11a) of the handle into the non-operative condition upon use of the resetting means (16).
 5. A device according to claim 1, characterised by the fact that the said cylindrical element (10c) is fitted with a couple of recesses (10d) arranged symmetrically with respect to the shank (10a) and on the side of this latter and designed to house a couple of blocks (50 and 51) connected to the rotary plate (18).
 6. A device according to claim 1, characterised by the fact that, on the side with the recess (10d) which houses the block (50), the said cylindrical element (10c) has a groove (20) while, on the opposite side, there is a groove (20a) which is used for the air to pass through, in order to charge the tank (2), the said air coming from the channel (3d) and flowing towards channel (3e).
 7. A device according to claim 1, characterised by the fact that the said cylindrical element (10c) has an arrow-shaped element (10e) with a tip which is designed to

close an opening (17a) in the chamber (17).

8. A device according to claim 7, characterised by the fact that the said arrow-shaped element (10e), to maintain the closure of the opening (17a), is assisted by a spring (10f) and a bolt (10g) which, both suitably set, have the task of making the seal between the surface (17d) of the chamber and the surface of the arrow-shaped element (10e) which must overcome the pressure coming from a channel (3f) and maintain the seal.
9. A device according to claim 6, characterised by the fact that the said groove (20) has a calibrated hole (21) whose calibration determines the time needed for resetting the device.
10. A device according to claim 1, characterised by the fact that the said channel (22) is connected to the calibrated hole (21) and is fitted with a check valve (8) which enters the chamber (7).
11. A device according to claim 1, characterised by the fact that the said channel (24) is housed between the small chamber (6a) and the chamber (7) and is fitted with a check valve (9).
12. A device according to claim 1, characterised by the fact that the said channel (27) is connected to the channel (3c) and terminates in position with the gap (11c) towards the external atmosphere where, nearby, there is a calibrated hole (12) fitted with an acoustic signalling device.
13. A device according to claim 1, characterised by the fact that the said chamber (17) is fitted with an outlet hole (17b) for the air coming from the main conduit and present in the chamber (17).
14. A device according to claim 1, characterised by the fact that the said spring (17c) which helps to push the cylindrical element (10c) into the operative condition is present in the chamber (17).

15. A device according to claim 1, characterised by the fact that the said rotary plate (18) is rotatably engaged with the bearing structure of the device at a point (18a).
16. A device according to claim 1, characterised by the fact that the said rotary plate (18) is fitted with a protrusion (18b) which is designed to engage, in the device's non-operative condition, with the second overhang (11g) and to rotate until the protrusion (18b) moves away from the second overhang (11g) when the handle (11) is pulled.
17. A device according to claim 1, characterised by the fact that the said rotary plate (18) comprises a couple of levers (30 and 31) located respectively, the first, between the protrusion (18b) and the centre of rotation (18a) and, the second, symmetrically with the first, in relation to the centre of rotation (18a).
18. A device according to claim 1, characterised by the fact that the said first lever (30) has one end (30a) positioned in the centre of the rotary plate (18) and the other end (30b) engaged with the block (50).
19. A device according to claim 1, characterised by the fact that the said first lever (30) is fitted with a first sprung element (300) designed to hold the block (50) in the recess (10d).
20. A device according to claim 1, characterised by the fact that the said second lever (31) has one end (31a) positioned in the centre of the rotary plate (18) and the other end (31b) engaged with the block (51).
21. A device according to claim 1, characterised by the fact that the said second lever (31) is fitted with a second sprung element (310) designed to hold the block (51) in the corresponding recess (10d).
22. A device according to claim 1, characterised by the fact that the said rotary plate (18) comprises a couple of mallets (40 and 41), each one of which has a spring (400 and 410) connected to it.
23. A device according to claim 22, characterised by the fact that at one end (40a) of the

- first mallet (40) there is a spring (400) connected which is designed to hold the mallet fast against a clamp (40b).
24. A device according to claim 22, characterised by the fact that at one end (41a) of the second mallet (41) there is a spring (410) connected which is designed to hold the mallet fast against a clamp (41b).
 25. A device according to claim 22, characterised by the fact that the free end of the mallet (41) is set to come into contact with one end of a small lever (43) held by a spring (43a) and fitted with a small protrusion (43b).
 26. A device according to claim 22, characterised by the fact that the free end of the mallet (40) is set to come into contact with one end of a small lever (44) held by a spring (44a).
 27. A device according to claim 26, characterised by the fact that the said small lever (44) has an enlargement (44b) which ends in a small pin (44c).
 28. A device according to claim 1, characterised by the fact that the said monitoring means (60) comprise the chamber (5), which is connected at one end to the channel (2a) and, on one side, is connected with the channel (3a) by means of a first union (68) and with the channels (3b and 3c) by means of a second union (69) and on the other side, symmetrically in relation to the axis of the chamber, respectively, to a channel (3g) and to the channel (3f).
 29. A device according to claim 1, characterised by the fact that inside the chamber (5) there is a piston (61) made of a central rod (61a) one end of which has a first enlargement (61b) which adheres to the internal walls of the chamber and whose movement is set to make the said rod come into contact with surface of the end (5a) when there is no air in the tank (2), leaving the passageway to the first union (68) open and symmetrically with the channel (3g), and the other end of which has a second enlargement (61c) which adheres to the internal walls of the chamber and whose movement is set to close the air passageway to the second union (69) and the channel (3f) when the device is in the non-operative condition.

30. A device according to claim 1, characterised by the fact that a spring (63) is housed between the free end of the second enlargement (61c) and the end (5b) of the chamber (5).
31. A device according to claim 1, characterised by the fact that the said stabilising element (70) is designed to hold the second overhang (11g) in position along a vertical axis.
32. A device according to claim 1, characterised by the fact that, connected to the stabilising element (70), are the resetting means (16) which comprise a small plate (16a) onto which a housing is set (16b) for a key, the said small plate (16a) being located with one side resting on a clamp (16c) and the other constrained by a spring (16d).
33. A device according to claim 1, characterised by the fact that the said device has a manual resetting element (80) which comprises screw means capable of pushing the main piston (10) and making it move into the non-operative condition.
34. A device according to claim 33, characterised by the fact that, connected to the screw means (80), is a first small bar (80a) which controls a signal in which the message OK appears if everything is fine while, if the device is not in the condition to work, the message KO appears.
35. A device according to claim 1, characterised by the fact that the said device comprises a second small bar (81) which controls a signal in which the message OK or RESET or WAIT appears, the said second small bar (81) being connected at one end to the rotary plate (18) between the centre of rotation (18a) and the point (31a) at which it is engaged with the second lever (31).
36. A device according to claim 1, characterised by the fact that the said channel (3e) is fitted with a check valve (4) located in proximity with the tank entrance (2).